

1. A method for sharing channel bandwidth, comprising:
 - generating a map interval defining channel transmissions for a period of time;
 - flexibly partitioning the map interval into a request interval, a management interval, a data+signaling interval, and a voice interval so as to optimize use of the channel bandwidth.
2. The method according to claim 1, further including transmitting the map interval on a downstream channel, wherein the map interval defines transmission for an upstream channel.
3. The method according to claim 1, further including generating a map interval for an upstream channel in a DOCSIS network.
4. The method according to claim 3, wherein the upstream channel corresponds to a hybrid-fiber-coax (HFC) connection.
5. The method according to claim 3, further including transmitting the map interval to one or more cable modems in the network.
6. The method according to claim 1, further including locating the request interval and the management interval adjacent to each other.
7. The method according to claim 6, further including locating one of the request intervals and the management interval at one end of the map interval.
8. The method according to claim 1, further including assigning a unique service flow ID for each traffic stream.

9. The method according to claim 1, further including allowing a soft partition among voice and data in which data is allowed to utilize unused bandwidth in voice interval with lower priority.

10. The method according to claim 1, further including placing voice unsolicited grants (UGs) contiguously within the voice interval.

11. The method according to claim 1, further including placing the request interval, management interval and voice UGs adjacent to each other at one end of the map interval so that a single contiguous interval is available for data+signaling.

12. The method according to claim 1, further including placing the request+management interval and voice UGs on opposite ends of the map interval so that a single contiguous interval is available for data+signaling.

13. The method according to claim 10, further including removing a UG from the contiguous UGs.

14. The method according to claim 13, further including rearranging the UGs so as to close a hole that has been created due to the departure of a voice call and its associated UG.

15. The method according to claim 14, further including filling the hole with data packets associated with one or more of request, management, signaling and data packets or the UG from a future voice call.

16. The method according to claim 1, further including placing UGs within the voice interval until a predetermined fraction of total bandwidth available for voice, data, and signaling is reached.

17. The method according to claim 1, further including maximizing contiguousness of the data+signaling interval.

18. The method according to claim 1, further including assigning a higher priority to signaling packets than data packets within the data+signaling interval.

19. The method according to claim 18, further including assigning unique SIDs to each signaling and data stream.

20. The method according to claim 1, further including generating a secondary request interval within the map interval if bandwidth is available.

21. A method for sharing upstream channel bandwidth in a DOCSIS system, comprising:
transmitting map intervals from a cable modem termination system on a downstream channel to a plurality of cable modems, wherein the map intervals define upstream traffic for the plurality of cable modems for a period of time in the future; and
flexibly partitioning the map intervals into a plurality of sub intervals based upon bandwidth requirements of the sub intervals.

22. The method according to claim 21, further including partitioning the map intervals into at least a request interval, a management interval, a data+signaling interval, and a voice interval.

23. The method according to claim 22, further including placing the management interval and the request interval together to form a contiguous interval.

24. The method according to claim 23, placing unsolicited grants (UGs) contiguously within the voice interval.

25. The method according to claim 24, further including moving UGs to maintain a contiguous UG interval after removal of a respective UG associated with a terminated voice call.
26. The method according to claim 24, further including filling a hole in the voice interval due to a terminated voice call with one or more packets associated with management, request, data, and signaling.
27. The method according to claim 21, further placing UGs within the voice interval up to a predetermined maximum bandwidth.
28. The method according to claim 21, further including minimizing fragmentation of the data+signaling interval.
29. The method according to claim 21, further including assigning separate SIDs to data and signaling streams.
30. The method according to claim 21, further including assigning a higher priority to signaling packets than data packets.
31. The method according to claim 21, further including forming a further request interval when bandwidth is available.